



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
[www.uspto.gov](http://www.uspto.gov)

*[Handwritten signature]*

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,638	10/15/2003	Anis Rahman		2637
26587	7590	01/05/2006	EXAMINER	
MCNEES, WALLACE & NURICK LLC 100 PINE STREET P.O. BOX 1166 HARRISBURG, PA 17108-1166			KIANNI, KAVEH C	
		ART UNIT	PAPER NUMBER	
			2883	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/605,638	RAHMAN, ANIS	
	<b>Examiner</b>	<b>Art Unit</b>	
	Kianni C. Kaveh	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 02 November 2005.  
 2a) This action is **FINAL**.                            2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 11-35,42 and 43 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 11-25,28-31,33-35,42 and 43 is/are rejected.  
 7) Claim(s) 18,26,27 and 32 is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 16 June 2005 is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

  
 1) Notice of References Cited (PTO-892)  
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)  
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 4) Interview Summary (PTO-413)  
 Paper No(s)/Mail Date \_\_\_\_\_.  
 5) Notice of Informal Patent Application (PTO-152)  
 6) Other: \_\_\_\_\_.

## **DETAILED ACTION**

Applicant's canceling of claims 36-41 in the amendment/response submitted on 11/02/05 is acknowledged.

### **Claim Objections**

Claim 18 is objected to because of the following informalities: The amended limitation(s) should be clearly shown either by underline for insertion of new limitation and or in brackets for deletion. Appropriate correction is required.

### ***Allowable Subject Matter***

Claims 26-27 and 32 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claims 26-27 are allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the amplifier block is comprised of a material that absorbs light in the 890 nanometer and the 1480 nanometer regions and emits light in the 13 10 nanometer and 1550 nanometer regions in combination with the rest of the limitations of the base claim.

Claim 32 is allowable because the prior art of record, taken alone or in combination, fails to disclose or render obvious wherein the modulator block is connected to the photonic integrated circuit through a first waveguide interconnect, and the photonic

integrated circuit is connected to the active unit through a second waveguide interconnect in combination with the rest of the limitations of the base claim.

### **Claim Rejections - 35 USC § 103**

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 11-25, 28-31, 33-35, and 42-43 rejected under 35 U.S.C. 103(a) as being unpatentable over Takada et al. (US 6278813).

Regarding claim 11, 23- 24, 28-31, 33-35 and 42-43, Takada teaches a second/third-phase optically photonic integrated circuit (shown in at least fig. 24) comprising an integrated circuit (shown in at least fig. 31; ), comprising: an input/output interface arranged on a substrate 1 comprising a plurality of waveguides 2 for simultaneously inputting at least one signal to and outputting at least one signal from the monolithically integrated circuit for demultiplexing a multiplexed optical signal in to n different constituent wavelengths and for combining n input optical signals composed of n different constituent wavelengths in to a multiplexed signal (shown in at least fig. 31, see also abstract and col. 2, 2<sup>nd</sup> parag.);

a slab waveguide 3 arranged on the substrate 1 having a first end and a second end, the first end coupled to the plurality of waveguides 2 of the input/output interface to focus the at least one input signal to the second end, and the second end coupled to an array waveguide , for focusing the at least one output signal to the input/output interface through the first end (shown in at least fig. Item input/output waveguides and output signal being focused out of the slab 2<sup>nd</sup> end through output/input waveguides 2); an array waveguide 93 arranged on the substrate 1 comprising a plurality of waveguides for coupling the one or more input signals (see waveguides in the area 88), separating the one or more input signals into the n different constituent wavelengths and focusing the n different constituent wavelengths back on to the slab 3 waveguide first end coupling to the input/output interface (shown in at least fig. 31, items waveguides coupling input light from the waveguides 2 through slab 3, and see col. 2, 2<sup>nd</sup> parag.), the plurality of waveguides of the array waveguide 93 being optically coupled at one end with the second end of the slab 3 waveguide, and terminated at an opposing end of the array waveguide by a reflective mirror 87, each waveguide of said array waveguide 93 having a predetermined path difference between successive waveguides (shown in at least fig. 31, items waveguides with different predetermined wavelengths), and the reflective mirror integrally disposed and formed along an edge of the integrated circuit at the opposing end of the array waveguide for reflecting the one or more signals incident on it from the array waveguide back into the array waveguide (shown in fig. 35,

item reflective mirror 96 integrally disposed and formed along an edge of the integrated circuit );

and an active unit 22 formed on the substrate, the active unit connected to the photonic integrated circuit by a waveguide interconnect means (see at least col. 29, 1<sup>st</sup> parag. and col. 3, lines 38-43; wherein active unit is an array of photodiode formed on a perspective output waveguide array); a signal processing unit comprises a plurality of n electro-optical elements coupled to the photonic integrated circuit for electro-optically processing the input and output signals (see fig. 53, item signal processing elements/unit(s) 22 and/or 23); wherein the photonic integrated circuit, the active unit and the signal processing unit are integrally fabricated (shown in at least fig. by a monolithic means (shown in at least fig. 30, 31 and 53, items 22/134 and 23).

However, Takada does not explicitly state that the above fabrication of integrated circuit including the reflector and processing means/unit fabricated through monolithic process/means; and that the above active unit is a waveguide amplifier and that the above signal processing unit is a modulator for interconnection to an external optical device/pump laser. The examiner responds that a device whether integrally formed and/or monolithically formed is a matter of design fabrication by an artisan skilled in the art and in which does not have bearing in functionality of the device in which a particular process is used for making the device:

*the presence of process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product In re Stephens, 145 USPQ 656 (CCPA 1965). See also 2113 Product-by-Process Claims: “[E]ven though product-by-process claims are limited by and defined by the process, determination of*

patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (Claim was directed to a novolac color developer. The process of making the developer was allowed. The difference between the inventive process and the prior art was the addition of metal oxide and carboxylic acid as separate ingredients instead of adding the more expensive pre-reacted metal carboxylate. The product-by-process claim was rejected because the end product, in both the prior art and the allowed process, ends up containing metal carboxylate. The fact that the metal carboxylate is not directly added, but is instead produced in-situ does not change the end product)

furthermore

*In re Larson*, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."); but see *Schenck v. Nortron Corp.*, 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983) (Claims were directed to a vibratory testing machine (a hard-bearing wheel balancer) comprising a holding structure, a base structure, and a supporting means which form "a single integral and gaplessly continuous piece." Nortron argued that the invention is just making integral what had been made in four bolted pieces. The court found this argument unpersuasive and held that the claims were

*patentable because the prior art perceived a need for mechanisms to dampen resonance, whereas the inventor eliminated the need for dampening via the one-piece gapless support structure, showing insight that was contrary to the understandings and expectations of the art.),* thus the examiner does not grant a patentable weight for such limitation, and that it would have been obvious to a person of ordinary skill in the art when the invention was made to choose the above active device as a mater of further modification of signal an optical amplifier since such amplifier on an AWG circuit is conventional and that it would have been obvious to a person of ordinary skill in the art when the invention was made to externally connect the above integrated circuit/RAWG to any external optical and/or non-optical device, such as a modulator or laser source, as a mater of further analyzing or processing the signal and since such interconnections are conventional, see the prior art of the record, and also suggested/implied by various embodiments by Takada, and since such optical integrated circuit enables accurately input/output desired frequencies and provide measurement without any loss (col. 11, 1<sup>st</sup> parag.).

Regarding claims 12-22 and 25, Takada further teaches wherein the active unit is selected from the group consisting of laser diodes, VCSELs, detector arrays and electro-optic modulators, receiver, transmitter, transceivers, and transponders (see at least col. 13, line 53; wherein also it is obvious to choose a frequency channel as a mater of choice); wherein any one of the waveguides of the input/output interface plurality of waveguides provides an input channel and a different waveguide of the input/output interface plurality of waveguides provides an output channel (shown in at least fig. 31, 33 and 21, items waveguides of input/output channel(s) ); see also at least

col. 25, last parag.+); wherein any one of the waveguides of the input/output interface plurality of waveguides provides an input channel and the remaining waveguides of the input/output interface plurality of waveguides are automatically output channels (shown in at least fig. 33, items waveguides of input/output/automatically output channels); wherein any one of the waveguides of the input/output interface plurality of waveguides provides an output channel and the remaining waveguides of the input/output interface plurality of waveguides are automatically input channels (shown in at least fig. 33, items waveguides of input/output/automatically output channels); wherein the one waveguide of the input/output interface is preselected as an input channel (shown in at least fig. 33, items waveguides of input/output preselected as input/output channel); wherein one of the plurality of waveguides of the input/output interface is an input and the remainder of the waveguides form output channels (shown in at least fig. 33, item #1 waveguide and output waveguides), and the number of output channels is  $n$  wherein  $n$  is selected from one of the group of integer numbers consisting of 4, 8, 12, 16, 24, 32, and 48 (see at least fig. 33, item Array waveguide grating 19 output with 4 output waveguides; wherein it is also obvious to choose any number of channels as a mater of choice); wherein one of the plurality of waveguides of the input/output interface is an output and the remainder of the waveguides form input channels, and the number of input channels is  $n$  wherein  $n$  is selected from one of the group of integer numbers consisting of 4, 8, 12, 16, 24, 32, and 48 (see at least fig. 33, item Array waveguide grating 93 outputs with 1 input waveguide; wherein it is also obvious to choose any number of channels as input/output a mater of choice); wherein  $n$  waveguides of the plurality of input/output

interface waveguides are spaced at a predetermined distance and form n channels (shown in at least fig. 33, item spaced waveguides with n channels); wherein the predetermined distance is selected from the group consisting of 0.25 nanometers, 0.4 nanometers, 0.8 nanometers, 1.6 nanometers, 4 nanometers, and 5 nanometers (see at least col. 2, line 10; wherein it is also obvious to choose channel spacing as mater of design choice); wherein n waveguides of the plurality of input/output interface waveguides form n channels, and the channel frequency is a predetermined frequency (see at least col. 8, 1<sup>st</sup> parag.); wherein the predetermined channel frequency is selected from the group consisting of about 31 GHz, and 50 GHz, 100 GHz, 200 GHz, 500 GHz, and 624 GHz (see at least col. 13, line 53; wherein also it is obvious to choose a frequency channel as a mater of choice).

*Previously Citation of Relevant Prior Art* Prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In accordance with MPEP 707.05 the following references are pertinent in rejection of this application since they provide substantially the same information disclosure as this patent does. These references are:Inoue et al. 5546483 teaches at least independent claims including an optical amplifier Kurokawa et al. 6456760 teaches modulator and amplifier in an AWAG/RAWG Kurokawa et al. 6122419 teaches modulator and amplifier in an AWAG/RAWG Purchase 200402086/21/0517 teaches modulator/amplifier in an AWAG/RAWG Dominic et al. 20050135778 teaches modulator/amplifier in an AWAG/RAWG Katayama 6892003 teaches modulator/amplifier in an AWAG/RAWGSEE ALSO at least other prior art provide by the applicant for obvious optical interfacing/units in AWG system. These references are cited herein to show the relevance of the apparatus/methods taught within these references as prior art.

- The Examiner kindly advises the Applicant to appropriately narrow the scope of the invention in order to allow the case.

***Response to Arguments and Amendment***

Applicant's argument filed on 11/02/05 have been fully considered but they are not persuasive.

Applicant assert (page 14, 2<sup>nd</sup> parag. and page 15, 3<sup>rd</sup> parag.-page 17, 1<sup>st</sup> parag.). that Takada's mirror is not monolithically integrated. The examiner, responds that first, the claimed limitation is "mirror integrally disposed and formed along an edge of the integrated circuit" which is clearly shown by Takada in fig 35, item mirror 96 is integrally disposed and formed along the right edge of the integrated circuit 90. Furthermore, if applicant assertion is direct to notion that the integrated device is fabricated/processed monolithically, then the Examiner responds that a device whether integrally formed and/or monolithically formed is a matter of design fabrication by an artisan skilled in the art and in which doe not have bearing in functionality of the device in which a particular process is used for making the device:

*the presence of process limitations on product claims, which product does not otherwise patentably distinguish over prior art, cannot impart patentability to the product In re Stephens, 145 USPQ 656 (CCPA 1965). See also 2113 Product-by-Process Claims: "[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art,*

*the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted) (Claim was directed to a novolac color developer. The process of making the developer was allowed. The difference between the inventive process and the prior art was the addition of metal oxide and carboxylic acid as separate ingredients instead of adding the more expensive pre-reacted metal carboxylate. The product-by-process claim was rejected because the end product, in both the prior art and the allowed process, ends up containing metal carboxylate. The fact that the metal carboxylate is not directly added, but is instead produced in-situ does not change the end product)*

*furthermore*

*In re Larson, 340 F.2d 965, 968, 144 USPQ 347, 349 (CCPA 1965) (A claim to a fluid transporting vehicle was rejected as obvious over a prior art reference which differed from the prior art in claiming a brake drum integral with a clamping means, whereas the brake disc and clamp of the prior art comprise several parts rigidly secured together as a single unit. The court affirmed the rejection holding, among other reasons, "that the use of a one piece construction instead of the structure disclosed in [the prior art] would be merely a matter of obvious engineering choice."); but see Schenck v. Nortron Corp., 713 F.2d 782, 218 USPQ 698 (Fed. Cir. 1983) (Claims were directed to a vibratory testing machine (a hard-bearing wheel balancer) comprising a holding structure, a base structure, and a supporting means which form "a single integral and gaplessly continuous piece." Nortron argued that the invention is just making integral what had been made in four bolted pieces. The court found this argument unpersuasive and held that the claims were patentable because the prior art perceived a need for mechanisms to dampen resonance, whereas the inventor eliminated the need for dampening via the one-piece gapless support structure, showing insight that was contrary to the understandings and expectations of the art.),*

thus the examiner does not grant a patentable weight for such limitation.

Applicant asserts (page 18, 1<sup>st</sup> parag.) that Takada does not teach that the device is integrated with an on-chip. The examiner responds that such limitation is not claimed by Applicant.

***THIS ACTION IS MADE FINAL***

This action in response to applicant's amendment made FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to K. Cyrus Kianni whose telephone number is (571) 272-2417.

The examiner can normally be reached on Monday through Friday from 8:30 a.m. to 6:00 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font, can be reached at (571) 272-2415.

**Any response to this action should be mailed to:**

Commissioner of Patents and Trademarks  
Washington, D.C. 20231

**or faxed to:**

(703) 872-9306 (for formal communications intended for entry)

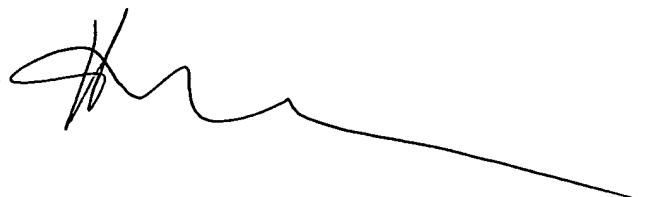
**or:**

Hand delivered responses should be brought to Crystal Plaza 4, 2021 South Clark Place, Arlington, VA., Fourth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956.

**KAVEH KIANNI  
PRIMARY EXAMINER**

K. Cyrus Kianni  
Primary Patent Examiner  
Group Art Unit 2883



January 4, 2006